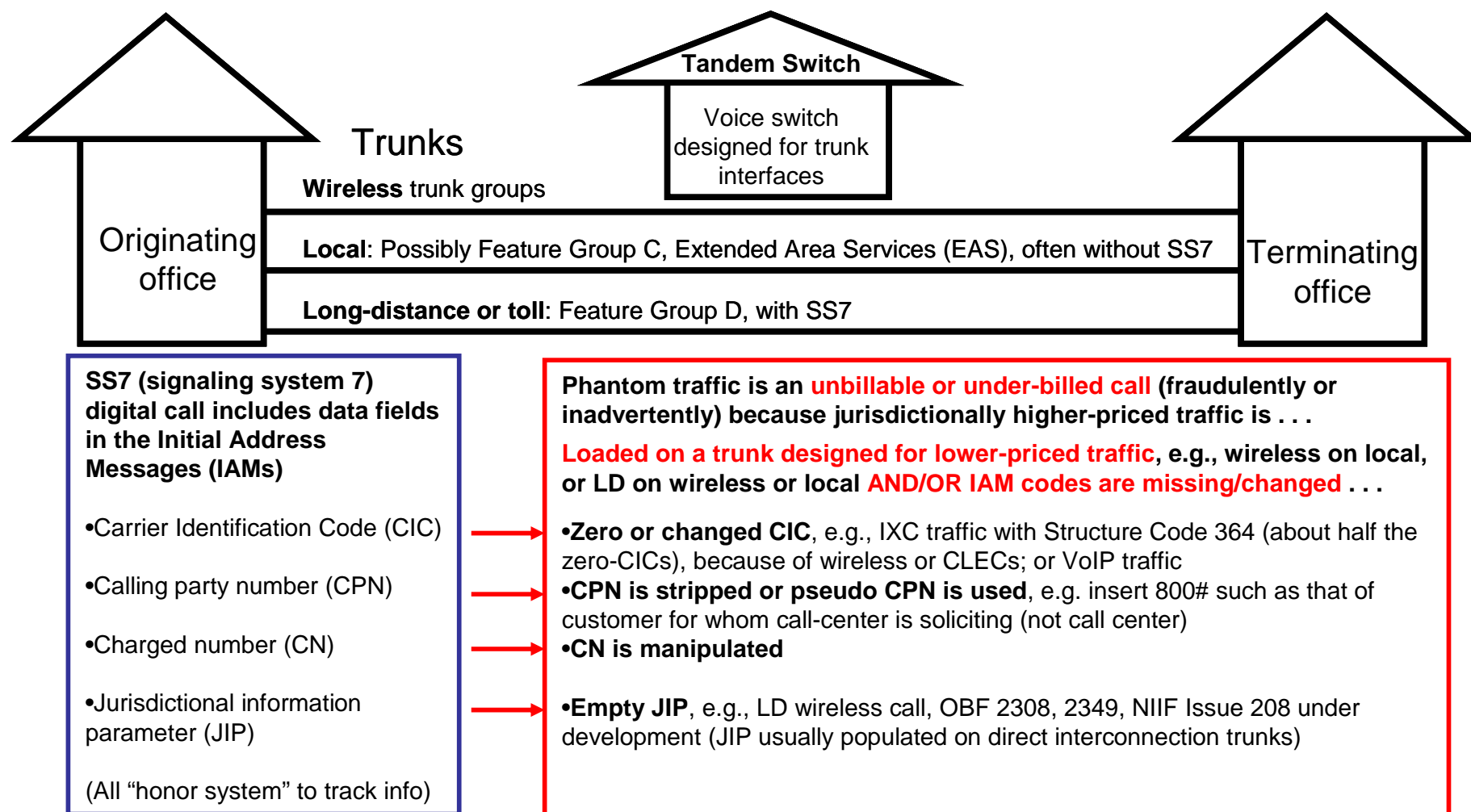


Phantom Traffic: Problem and Solutions

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- Phantom traffic
 - What is it?
 - How do you find it?
 - How big is the problem?
 - What should be done about it?
 - Why should you care about it?
- Excerpts from working draft of Mid-Size carrier report
- Summary
- End-notes *(numeric end-note references throughout the slides are detailed here)*
- Credits

Defining Phantom Traffic



Source: Balhoff & Rowe, LLC

Discovering Phantom Traffic

For example . . .

Shifts in traffic volumes signal growing "fraud," as represented by the following data from one rural company . . .

Minutes (in 000s)	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05
Local	2,576	2,153	1,938	3,705	2,767	3,083
LATA	1,891	2,181	1,006	685	600	753
Total billed	4,467	4,334	2,944	4,390	3,368	3,836
Local % of total	57.7%	49.7%	65.8%	84.4%	82.2%	80.4%

Source: Balhoff & Rowe, LLC, and a Texas rural company

In another internal company report, the number of "toll" trunk group calls fell to 18% of total calls in 2005 from 30% of total calls in 2003

Most of the analyses reveal traffic being shifted to avoid jurisdictionally higher rates, notably when otherwise unexplained drops occur in long-distance volumes in FGD (LD) trunk traffic, offset by virtually the same volume increases in local traffic on other trunks

•Jurisdictional info
(All "honor system")

•Empty JIP

Source: Balhoff & Rowe, LLC

Tandem Switch

Extended Area Services (EAS), offered without SS7

Group D, with SS7

Terminating office

Indicators of Phantom Traffic*

- CPN is stripped
- CN is manipulated
- Use of pseudo CPNs
- Sudden shifts in CPN delivery percentages
- Average holding time (AHT) shifts
- Percentage of unanswered calls trending higher
- Historical and volume data trend studies (carrier, state, interstate, intrastate, Local MOUs, comparisons of market share and industry trend data against a carrier's minutes of use (MOU) trend data
- Studies by revenue-assurance consultants such as ATS, Tekelec, Engel, NECA Services, etc.

* Source: Verizon (Bellinghausen) to Pennsylvania Telephone Assoc., 9/24/04

Sizing the Problem

For example . . .

We believe a realistic approach—based on our studies and debriefings of revenue-assurance experts—is the following.

Assume rural rates of 1.8 cents/minute for wireless termination and 2.7 cents/minute for blended LD, while an RBOC could be assumed to have rates of 1.2 cents and 0.4 cents/minute for the same services, respectively.

(Higher rates for rural carriers because of more expensive network ops and investment due to lesser scale and longer loop lengths)

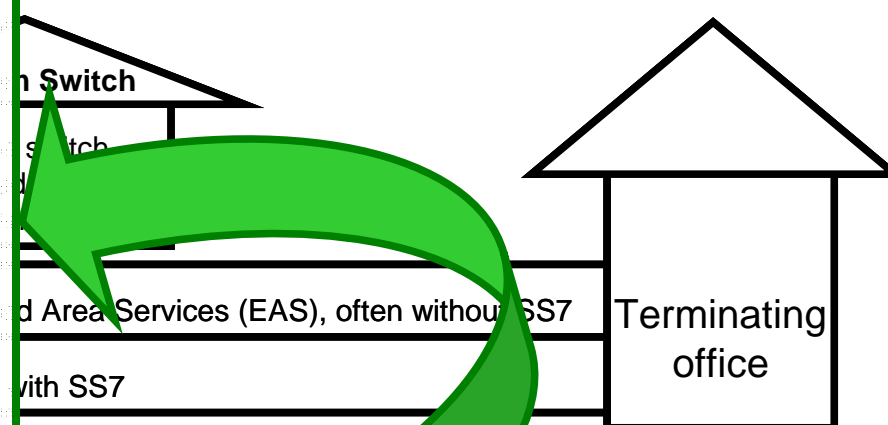
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An estimation . . .

Revenue losses (if PT=20% of access minutes) ¹
(PTx0.33xLD rate) + (PTx0.67xWireless termination rate)

•Ca	RBOC losses/line annually	\$9
•Ca	Rural losses/line annually	\$30
•Ca	Total RBOC losses annually	\$1.4 billion
•Ca	Total rural losses annually	\$600 million
•Ju	Total industry losses at 20% lost	\$2.0 billion
(Al	PLUS estimated monitoring costs	\$1 billion
system)	TOTAL estimated losses to LECs ²	\$3.0 billion

Source: Balhoff & Rowe, LLC



Revenue and cost perspectives

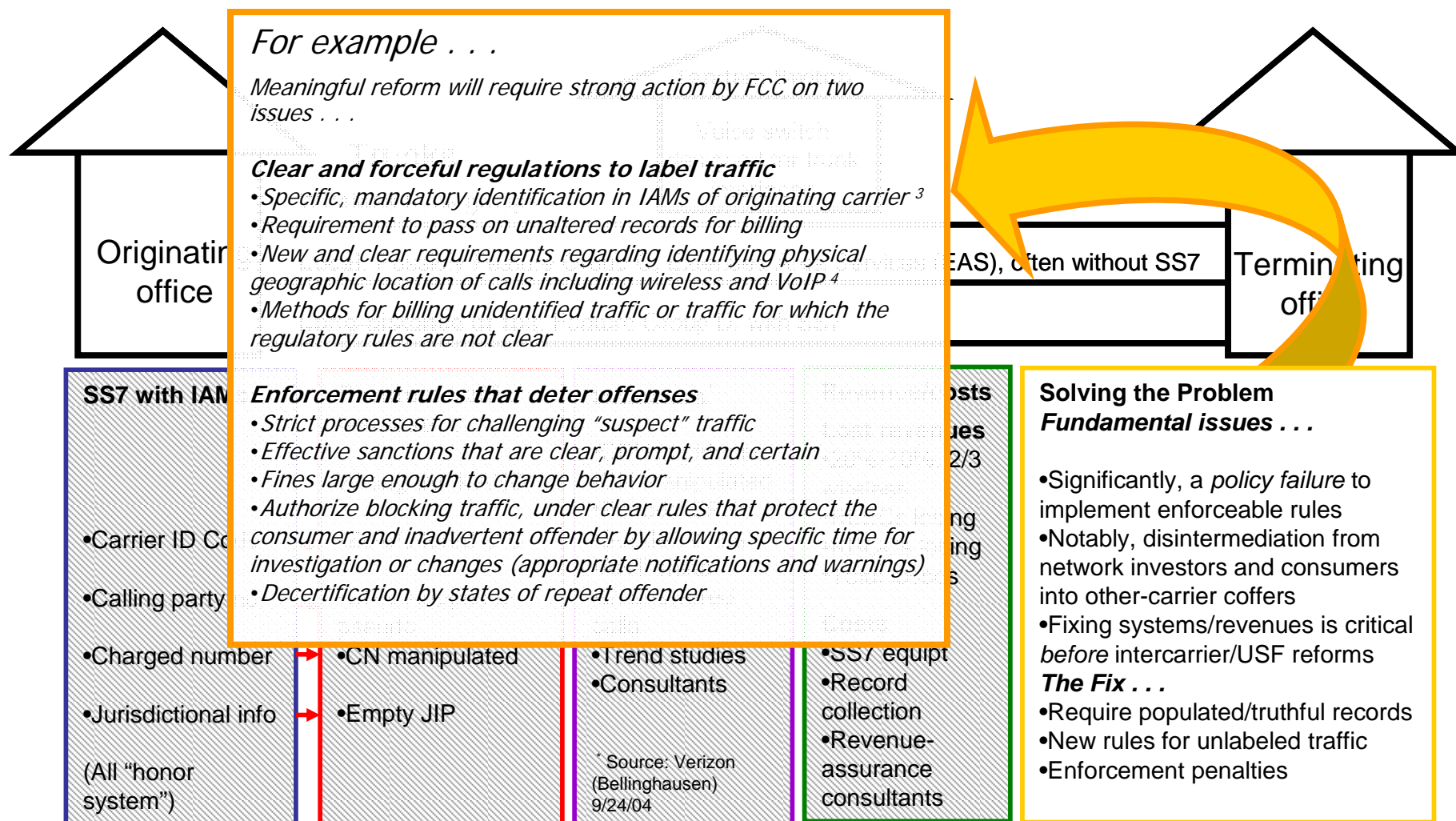
Factoring the “lost” revenues is difficult, but . . .

- Studied exchanges are revealing up to 20%-30% of minutes are phantom—2/3 being wireless
- Rurals are losing a larger proportion of revenues than RBOCs—estimated at 10%-15% v. 4%-5% for RBOCs
- RBOCs report internal (unpublished) estimates of billions of dollars industry-wide lost on an annual basis

Factoring the “discovery” costs . . .

- Additional SS7 equipment for rurals to monitor phantom traffic is \$15,000+ per switch for SS7 probes
- Mid-size carrier estimates for record collection, internal analyses, etc., range from \$40,000 upward
- Revenue-assurance consultant-studies are \$20,000+

Solving the Problem



Importance for Policymakers

- Why should Congress care?
 - Important to understand issues that distort marketplace
 - Concern for consumers in terms of financial forces affecting national infrastructure
 - Systematic non-payment of funds risks investment in new technologies including broadband
 - Phantom traffic potentially imposes more financial pressures on USF
 - Clarify causes and scope of phantom traffic problem
 - Identify and support implementable solutions
 - Legislation if FCC lacks adequate authority or direction
- Why should FCC care?
 - FCC and state systems for intercarrier compensation are proving inadequate
 - Inadvertent failures to label traffic
 - Arbitrageurs are gaming the jurisdictional systems
 - New technologies are rendering the current rules as outdated
 - Much of the problem appears to be fundamental gaming of FCC rules
 - Preparation for intercarrier reform
 - Intercarrier reform is in part premised on understanding appropriate and current levels of payments
 - Systems in support of appropriate network-support and enforcement should be tested
 - Goodwill in the reform processes is critical, including recognition of underlying value of network investment
- Why should State Public Utility Commissions care?
 - Coordinate state-level strategies
 - Support for appropriate legislative solutions
 - Rulemaking issues in the near-term and for longer-term investment
 - Need for protection of industry rights and developing agreements
 - Enforcement obligations

Excerpts from Working Report

The executives of five mid-size local exchange companies committed to a study of the growing phantom traffic problem. The slides in this presentation and the bullets below are excerpts from the working study.

From the working report of the Mid-Size Carriers . . .

- Internal company experts and revenue-assurance consultants generally report that 20%–30% of compensable traffic *in the exchanges they have studied* is arriving at terminating carriers in a form in which billing information is absent, lost, stripped or altered.
- There appear to be four general kinds of “phantom traffic”: (1) traditional long-distance traffic is sometimes re-routed to hide the origin, (2) traffic is altered to change data that identifies the origination (sometimes innocently and often not), (3) traffic does not contain sufficient information to track the geographic origin, including wireless, ported numbers, and virtual NXX services, and (4) IP or VoIP is not identified even though the traffic is carried on the Public Switched Telephone Network (PSTN).
- There are potential phantom traffic-related problems at each layer—origination, transport, tandem, and termination. Most attempts to address phantom traffic have been carrier-by-carrier (without any policymaker intervention), and have involved expensive and frustrating audit processes at the trunk or end-office levels. This has sometimes become a cat-and-mouse exercise in which “offending” carriers have two outcomes: (1) Avoid the compensation obligation, or (2) If caught, remit only what otherwise would have paid.
- The phantom traffic problem is almost certainly in part inadvertent, but appears to be significantly the fault of carriers that are abusing the system, and is possibly more importantly a systemic policy failure to define and enforce an appropriate reporting, payment and enforcement regime. Originating carriers are incited to take advantage of ambiguous termination rules in a rapidly changing world.
- Importantly, the resolution of problems related to phantom traffic and lost revenues appears to be absolutely necessary before addressing the larger intercarrier reform because (1) a LEC’s revenue base as defined going into intercarrier reform needs to be set at an appropriate level so that any subsequent adjustments are made from the correct starting point, (2) systems for defining and tracking compensable traffic should be well understood both before and after intercarrier reform, including approaches to wireless traffic, re-routed TDM traffic and emerging IP-based services that are transited and terminated over the PSTN, (3) systems for enforcing the regulations must be carefully designed and tested, and (4) the **principle regarding appropriate compensation for use of networks** should be sufficiently understood and supported by key industry participants, including the policymakers.
- The most far-reaching and cost-effective solution appears to be an improved and rigorous system approved by the FCC to label traffic accurately; better define geographic origination (wireless and IP); maintain the data to the point of termination; and strengthen the discipline through the threat of strong sanctions through blocking of traffic (after appropriate notifications and warnings), and/or decertification if the carrier is determined to be a repeat offender.
- Certain experts in the mid-size carriers have begun to formulate stricter rules that might be introduced to the FCC or to the states; the initial ideas are focused on (1) more specific identification of the originating carrier, (2) improvements in record-keeping and billing, (3) new methods of identifying the geographic location of wireless calls, (4) methods for billing unidentified traffic or traffic for which the regulatory rules are not clear, (5) and penalties that include procedures for challenge, blocking and decertification of carriers.

- In some significant instances, phantom (unbillable terminating) traffic appears to be a significant problem, accounting for as much as 20%-30% of a terminating carrier's minutes
- Revenue and monitoring costs may diminish industry-wide operating income by \$3 billion, with potential negative effects on investment in new technologies
- The problem is likely to grow worse with the expanding dependence of newer technologies that ride on the LEC networks
- The problem cannot be resolved by the industry, but requires the intervention of policymakers in setting clear and enforceable regulation
- Phantom traffic is an issue that should be resolved *before* other potential discussions of intercarrier compensation or universal service
- Solutions have been proposed by industry groups

¹Some carriers report significantly higher losses as suggested by Twin Lakes Telephone Cooperative, which serves more than 30,000 access lines around Gainesboro, Tennessee. The carrier reported phantom traffic losses of 50%. See http://enews.primediabusiness.com/enews/telephony/technology_update/2005_04_20_april_20_2005/view.html#feature2.

²We acknowledge that it is very difficult to be precise about the lost revenues or the incremental costs in monitoring so-called "phantom traffic." The table is designed to provide policymakers with some sense of the financial magnitude of the problem and therefore the risk to the telecommunications' infrastructure providers—without overstating or understating the issue. Most of the revenue-assurance studies point to 20%-30% revenue losses in *exchanges the carriers and the consultants study*, but admittedly there are not network-wide studies or verifiable time-series data. For our analysis, we are sufficiently clear about the approximate size of the problem after working with experts at five consulting organizations and seven carriers. In each of those consultations, the carriers and consultants have engaged in internal studies that appear credible in pointing to a problem that is not likely lower than 15%-20% of the total number of minutes. The problem is very possibly larger and growing because of technology changes and more sophisticated, probably undiscovered gaming by specific carriers. We have been informed of specific carriers that regularly engage in fraud, and, in a major gaffe, of a certain carrier that mistakenly transmitted its "phantom traffic" detail to a terminating carrier. Our opinion is that the dollar figures are reasonable in this table, based on the methodology outlined, but that the problem could be modestly smaller or even significantly larger since it is assumed that not all the unbillable traffic is discovered in the studies in question. We suspect that the monitoring costs are higher than our estimates, but our estimate of \$1 billion is based on equipment and monitoring from several rural carriers which we have extrapolated to the remainder of the rural community. Our rural estimate may be high, since some of the smaller carriers may not be engaging in monitoring, but we have estimated nearly \$150 million in monitoring/OBF/personnel/equipment costs, and we have assumed that the RBOCs have higher costs and more sophisticated systems.

³OBF has suggested rules that appear to address some problems, if certain language is strengthened by the FCC, notably by omitting the problems created in stating "where technically feasible" or "where technologically possible." The rules in this note, with the exceptions noted, seem sensible as articulated on December 8, 2004, when the Billing Committee of OBF reached a consensus to use the 7 Rules for Populating JIP approved by NIIF in NIOC Issue 0208 to identify the originating switch or MSC. The Billing Committee supports those rules recognizing that the JIP at a state/LATA level will not provide sufficient detail to determine local jurisdiction. Specific to OBF Issue 2349, Rule #2 states the "JIP should be populated with an NPA-NXX that is assigned in the LERG to the originating switch or MSC." The Billing Committee's preferred solution would have been to use the JIP at a cell site level. Based on industry limitations, this was judged at the time to be an unworkable solution. The rules are [our emphasis in italics is added]: (1) JIP should be populated in the Initial Address Messages (IAMs) of all wireline and wireless originating calls *where technically feasible*. (2) JIP should be populated with an NPA-NXX that is assigned in the LERG to the originating switch or MSC. (3) The NIIF does not recommend proposing that the JIP parameter be mandatory since calls missing any mandatory parameter will be aborted. However the NIIF strongly recommends that the JIP be populated on all calls *where technologically possible*. (4) *Where technically feasible* if the originating switch or MSC serves multiple states/LATAs, then the switch should support multiple JIPs such that the JIP used for a given call can be populated with an NPA-NXX that is specific to both the switch as well as the state and LATA of the caller. If the JIP cannot be populated at the state and LATA level, the JIP should be populated with an NPA-NXX specific to the originating switch or MSC *where it is technically feasible*. (5) Where the originating switch cannot signal JIP it is desirable that the subsequent switch in the call path populate the JIP using a data fill default associated with the incoming route. The value of the data fill item is an NPA-NXX associated with the originating switch or MSC and reflects its location. (6) When call forwarding occurs, the forwarded from DN (Directory Number) field will be populated, the JIP will be changed to a JIP associated with the forwarded from DN and the new called DN will be inserted in the IAM. (7) As per T1.TRQ2, the JIP should be reset when a new billable call leg is created.

⁴The problem with identifying the physical geographic origin of a call was also addressed by OBF in its Consensus Resolution Reached on OBF Issue 1921 on November 8, 2000. The Resolution states: "On the CAT 1101xx records, the originating OCN [Operating Company Number] field (positions 167-170) should be populated with the OCN of the company that originated the call under the following conditions: The "from" number (positions 15-24) is ported and the originating LRN fields (positions 157-166) is populated. The company originating the call does not have a CIC code. The company originating the call has a CIC, but completed the call over a trunk group used for local interconnection. On the CAT 1150 MPB records, a new field titled "Originating Company OCN" will be added in position 176-179. The Special consideration section on the Record Description pages will reflect: The originating OCN field (positions 176-179) should be populated with the OCN of the company that originated the call under the following conditions: The company originating the call does not have a CIC code; the company originating the call has a CIC, but completed the call over a trunk group used for local interconnection. It was recognized that the tandem company may not be able to correctly populate the originating company OCN when the originating company has ported numbers. This would apply to both landline and cellular originating companies.



About Balhoff & Rowe

Balhoff & Rowe, LLC, is a specialized professional services firm focused on providing financial-regulatory advice. The principals have nearly 30 years of experience in advising investors and regulators on complex investment issues. They have provided services to a wide range of communications companies, including incumbents, competitive carriers, wireless operators and cable operators. Additionally, the firm has expertise in energy and other utility services.

The services of Balhoff & Rowe include research, think-tank projects, professional facilitation, advocacy efforts, financial and restructuring advice for various companies, carriers and policymakers. The company offers an unparalleled combination of experience, credibility, strategic insight and access in a rapidly changing environment.

Michael J. Balhoff, CFA, Managing Partner

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